Global Nuclear Fuel
A Joint Venture of GE, Toshiba, & Hitachi

Global Nuclear Fuel

Scott P. Murray
Manager, Facility Licensing

3901 Castle Hayne Road
P.O. Box 780, Mail Code K-84
Wilmington, NC 28402
USA

T 910 819 5950
F 910 362 5950
Scott.Murray@ge.com

SPM 12-052

December 20, 2012

ATTN: Document Control Desk
Director, Office of Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: Revision to Reply to Notice of Violation, EA 11-095

References: (1) License SNM-1097, Docket 70-1113
(2) NRC Inspection Report, 70-1113/2011-010 and Notice of Violation, 11/14/11
(3) GNF-A Reply to NOV, S. Murray to NRC Document Control Desk, 12/14/11
(4) Response to Reply to NOV, M. Sykes to N. Holmes, 12/22/11

GNF-A, has completed all of the immediate and short term corrective actions to prevent recurrence and seven of the eight longer term comprehensive improvement actions for the Notice of Violation dated November 14, 2011 (Reference 2). Upon further review, one of the longer term actions (item 4) shown below has been determined to be in excess of that needed to directly address the violation.

4) Revise the radiation protection monitor training program using a Systematic Approach to Training. Scheduled completion – June 2013

As a result, GNF-A requests removal of this item as a longer term corrective action from our previous violation response dated December 14, 2011. (Reference 3)

Please contact me on (910) 819-5950 if you have any questions or would like to discuss this matter further.

Sincerely,

Julie Chrissotimos for SPM

S. P. Murray, Manager
Facility Licensing

Attachment: Revised GNF-A Reply to Notice of Violation

Commitments: Per attached

cc: Victor McCree, NRC Regional Administrator, Region II Atlanta
M. Sykes, NRC Region II, Atlanta
M. L. Thomas, NRC Region II, Atlanta, GA
M. N. (Nick) Baker, NRC NMSS, Washington, D.C.
Lee Cox, NC DECNR

Attachment

The information provided below summarizes the Notice of Violation dated November 14, 2011 associated with NRC Inspection Report 70-1113/2011-010

VIOLATION NO. EA 11-095

A. Safety Condition No. S-1 of Special Nuclear Material License No. 1097 requires that material be used in accordance with statements, representations, and conditions of application dated and supplements dated June 29, 2007; February 14, 2008; November 28, 2008; January 8, 2009; August 13, 2010; and December 2, 2010.

Section 5.1.1, Criticality Safety Design Philosophy, of the License Application, states that the Double Contingency Principle as identified in nationally recognized American National Standard ANSI/ANS-8.1 (1998) is the fundamental technical basis for design and operation of processes within the GNF-A fuel manufacturing operations using fissile materials. As such, "process designs shall incorporate sufficient margins of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible." For each significant portion of the process, a defense of one or more system parameters is documented in the criticality safety analysis, which is reviewed and enforced.

Section III.B, Criticality Safety Controls for Dry Uranium Dioxide (U02) Processes (MCA), of Criticality Safety Analysis (CSA) - No. 2310.00, Primary HEPA Filter Systems, Revision 2 states, in part, that mass and moderation controls as necessary controls to meet this analysis. In order to achieve mass control the U02 holdup is limited to less than 25 kilograms (kgs) by controlling p across the housing to 4-inches of H20 or less.

Contrary to the above, on March 1, 2011, the licensee failed to ensure that a process design incorporated sufficient margins of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident was possible. Specifically, the licensee failed to ensure that the U02 holdup in the high efficiency particulate air (HEPA) filter enclosure for the Sinter Test Grinder was limited to less than 25 kgs.

B. 10 CFR 70.61(b) states that the risk of each credible high-consequence event must be limited. Engineered controls, administrative controls, or both, shall be applied to the extent needed to reduce the likelihood of occurrence of the event so that, upon implementation of such controls, the event is highly unlikely.

Contrary to the above, on March 1, 2011, the licensee failed to apply sufficient controls to the extent needed to reduce the likelihood of occurrence of a criticality in the Sinter Test grinder HEPA filter enclosure so that, upon implementation of such controls, the event is highly unlikely.

C. Safety Condition No. S-1 of Special Nuclear Material License No. 1097 requires that material be used in accordance with statements, representations, and conditions of

application dated and supplements dated June 29, 2007; February 14, 2008; November 28, 2008; January 8, 2009; August 13, 2010; and December 2, 2010.

Section 5.4.1, Control Practices, of the License Application dated February 24, 2009, states that criticality safety analyses identify specific controls necessary for the safe and effective operation of a process. Prior to use in any enriched uranium process, nuclear criticality safety controls are verified against criticality safety analysis criteria.

Section 5.4.1.1, Verification Program, of the License Application dated February 24, 2009, states that the purpose of the verification program is to assure that the controls selected and installed fulfill the requirements identified in the criticality safety analyses. All processes are examined in the "as-built" condition to validate the safety design and to verify the installation. Criticality safety function personnel observe or monitor the performance of initial functional tests and conduct pre-operational audits to verify that the controls function as intended and the installed configuration agrees with the criticality safety analysis.

Section III.B, Criticality Safety Controls for Dry Uranium Dioxide (U02) Processes (MCA), of GSA - No. 2310.00, Primary HEPA Filter Systems, Revision 2 states, in part, that the U02 holdup is limited to less than 25 kgs by controlling delta p across the housing to 4-inches of H20 or less.

Contrary to the above, on February 4, 2009, the licensee failed to assure that controls selected and installed fulfilled the requirements identified in GSA — No. 2310.00, Primary HEPA Filter Systems. Specifically, the licensee failed to assure that the U02 holdup would be limited to less than 25 kgs by controlling delta p across the housing to 4-inches of H20 or less.

D. Safety Condition No. S-1 of Special Nuclear Material License No. 1097 requires that material be used in accordance with statements, representations, and conditions of application dated and supplements dated June 29, 2007; February 14, 2008; November 28, 2008; January 8, 2009; August 13, 2010; and December 2, 2010.

Section 5.3.1, General Configuration Management, of the License application dated February 24, 2009, states, in part, that a CSA is prepared or updated for new or significantly modified fissile units, processes, or facilities within GNF-A.

Section 5.4.5.5, Criticality Safety Analysis, of the License application dated February 24, 2009, states in part that a GSA includes applicable information requirements as follows: Scope, General Discussion, Criticality Safety Controls/Bounding Assumptions, Model Description, Calculational Results, Safety During Upset Conditions, Specifications and requirements for Safety, Compliance, Verifications, and Appendices.

Contrary to the above, on February 18, 2009, the licensee failed to conduct a CSA on the Sinter Test Grinder, and performed a criticality safety summary (CSS) that did not meet the license requirement of conducting a GSA. Specifically, the licensee failed to

conduct all Model Description, and Calculational Results sections; and parts of the Criticality Safety Controls/Bounding Assumptions.

E. Safety Condition No. S-1 of Special Nuclear Material License No. 1097 requires that material be used in accordance with statements, representations, and conditions of application dated and supplements dated June 29, 2007; February 14, 2008; November 28, 2008; January 8, 2009; August 13, 2010; and December 2, 2010.

Section 11.5, Procedures, of the License Application dated March 30, 2007, states that licensed material processing or activities will be conducted in accordance with properly issued and approved management control procedures.

Section 5.2.3.3, Primary HEPA Filter Housing Transition, of Nuclear Safety Instruction 0- 15.0, Revision 33, states, in part, that if the survey results of a transition exceed the action limit of 0.5 mr/hr above background notify HVAC and the area manager and request a clean out of the effected transition.

Contrary to the above, on August 1, 2010, and January 23, 2011, the licensee failed to notify HVAC and the area manager and request a clean out of the effected Sinter Test Grinder Primary HEPA Filter housing transition when the survey results for the transition exceeded the action limit of 0.5 mr/hr above background.

This is a Severity Level III Problem (Enforcement Policy Section 6.2)
Civil Penalty - $17,500 (EA-11-095)

GNF-A's Response to Violation:

GNF-A concurs with the violation and associated civil penalty as listed in inspection report number 70-11113/2011-010 and enforcement action EA-11-095.

1) The reasons for the violation included:

1. The Sinter Test Grinder HEPA filter was not changed on a routine basis;
2. A filter housing transition clean out after the filter change was not performed;
3. Routine radiation surveys did not trigger HEPA filter change out and HEPA housing transition clean out;
4. The powder collection design did not perform as expected, risk assessment and mitigation plan did not adequately address HEPA filter UO2 buildup;
5. No post-operation validation of UO2 mass balance was conducted; and,
6. GNF-A incorrectly evaluated the reporting criteria and did not report 30.9 kg of UO2 powder found during a HEPA filter change performed on February 5, 2011.

The initial root cause analysis identified four primary causal factors that generally fall into categories of design process, procedures (both adequacy and adherence), and communications.

Design – Problem Not Anticipated

Reliance on a previously established relationship between filter differential pressure and filter from the UO2 production grinders. HEPA filter replacements were based on differential pressure monitoring and not service time (not effective due to smaller UO2 particle sizes and process characteristics).

Design – Needs Improvement

Grinder particles remained entrained in the airflow and were not removed to a collection canister as designed. Inadequate technical review of particle behavior in the exhaust system.

Management Systems – Procedures/Communications Need Improvement

Failed to follow radiation safety procedures that require actions when an exhaust system dose rate survey exceeds an action limit. Resulted in lack of timely response and system cleanout.

Management Systems – Procedures Need Improvement

Maintenance procedures lacked sufficient inspection details to identify powder accumulation during operation or following a filter change.

2) Short term corrective actions taken and completed.

GNF-A has taken comprehensive actions to correct the primary causes of the event, ensure compliance with regulatory requirements and to provide adequate protection of workers, the public and the environment and as follows:

1) The prompt restoration of compliance with double contingency requirements by installing 6 inch favorable geometry HEPA filter;
2) Confirmed assumptions regarding relationship between differential pressure and powder collected in HEPA filters during typical applications;
3) Completion of extent of condition reviews;
4) Modified procedures in the areas of configuration management, radiation protection, and HVAC;
5) Updated criticality safety analysis for primary HEPA filters;
6) Improved preventive maintenance for applicable HEPA filters and pre-filters;
7) Conducted an independent assessment of radiation protection program;
8) Evaluated the work order prioritization process;
9) Modified the Safety Event Communication and Notification procedure;
10) Training on procedural compliance, conservative decision making, and questioning attitude.

3) Longer term corrective actions

Both an operational performance assessment and a second root cause analysis specific to the STG event were conducted by an independent team using the management oversight risk tree (MORT) process to assess the management and organizational aspects of the event.

The key focus areas included safety culture, training, radiation protection, staffing, procedures, and maintenance-specific actions.

As a result of the MORT root cause analysis (RCA) and operational performance assessment that were performed, longer term corrective actions, as they relate to licensed activities, are listed below. These commitments are paraphrased from the RCA and assessment reports already provided to the NRC and, in some cases, reflect multiple actions. A detailed roadmap of underlying actions is available for inspection.

Safety Culture

1. Develop an internal program to assess Safety Culture on an ongoing basis.
   Scheduled completion – June 2012

Training

2. Develop and provide training to employees related to safety culture.
   Scheduled completion – September 2012

Radiation Protection

3. Implement an enhanced process to track and trend radiation protection survey results including criteria for actions.
   Scheduled completion – September 2012

Staffing

4. Establish a clear line of accountability that gives the appropriate management team member authority and responsibility for plant operation with independent oversight from EHS and Quality.
   Scheduled completion – April 2012

5. Document skill set requirements for employees in HVAC engineering.
   Scheduled completion – September 2012

Procedures

6. Revise internal event notification procedure to include specific expectations for shutdown and restart conditions and provide training to affected individuals. Scheduled completion – March 2012

Maintenance

7. Enhance the process to schedule, plan, prioritize and manage work orders, including assessment of time based preventive maintenance for HEPA filters. Scheduled completion – December 2012

4) The date when full compliance will be achieved

Full compliance was achieved by December 14, 2011 with the completion of the short term corrective actions.

The additional corrective actions, shown above, to drive long term comprehensive Improvements have also been completed.